

Tikrit University

College of Nursing

Basic Nursing Sciences



Second Year - 2023-2024

Microbiology

Malaria

By: lecturer

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MALARIA

- causative agent = Plasmodium species
- 4 human Plasmodium species
- P. falciparum – Pf----- Quartan malaria
- P. vivax –Pv----- Falciparum malaria
- P. ovale – Po----- Black water fever
- P. malariae- Pm----- Tertian malaria

***Infective form:** Sporozoite

***Period of one erythrocytic stage:** P.V 48h; P.M 72h; P.F 36-48h

Classification:

Taxonomical classification of malaria

Kingdom: Protista

Subkingdom: Protozoa

Phylum: Apicomplexa

Class: Sporozoasida

Order: Eucoccidiorida

Family: Plasmodiidae

Genus: Plasmodium

Species: falciparum, malariae, ovale, vivax

A bite from an infective female Anopheles mosquito.



Anopheles must be infected through a previous blood meal taken on an infected person to transmit malaria

Life Cycle

- transmitted by Anopheles mosquitoes
- sporozoites injected with saliva
- sporozoites invade liver cells
- undergo an asexual replication
- 1000-10,000 merozoites produced.

The intermediate host: Man, inside the liver cells and RBCs.

Asexual life cycle

1-Exo - erythrocytic schizogony In the liver cells: merozoites (within schizont) will formed, which either infect another liver cells or RBCs.

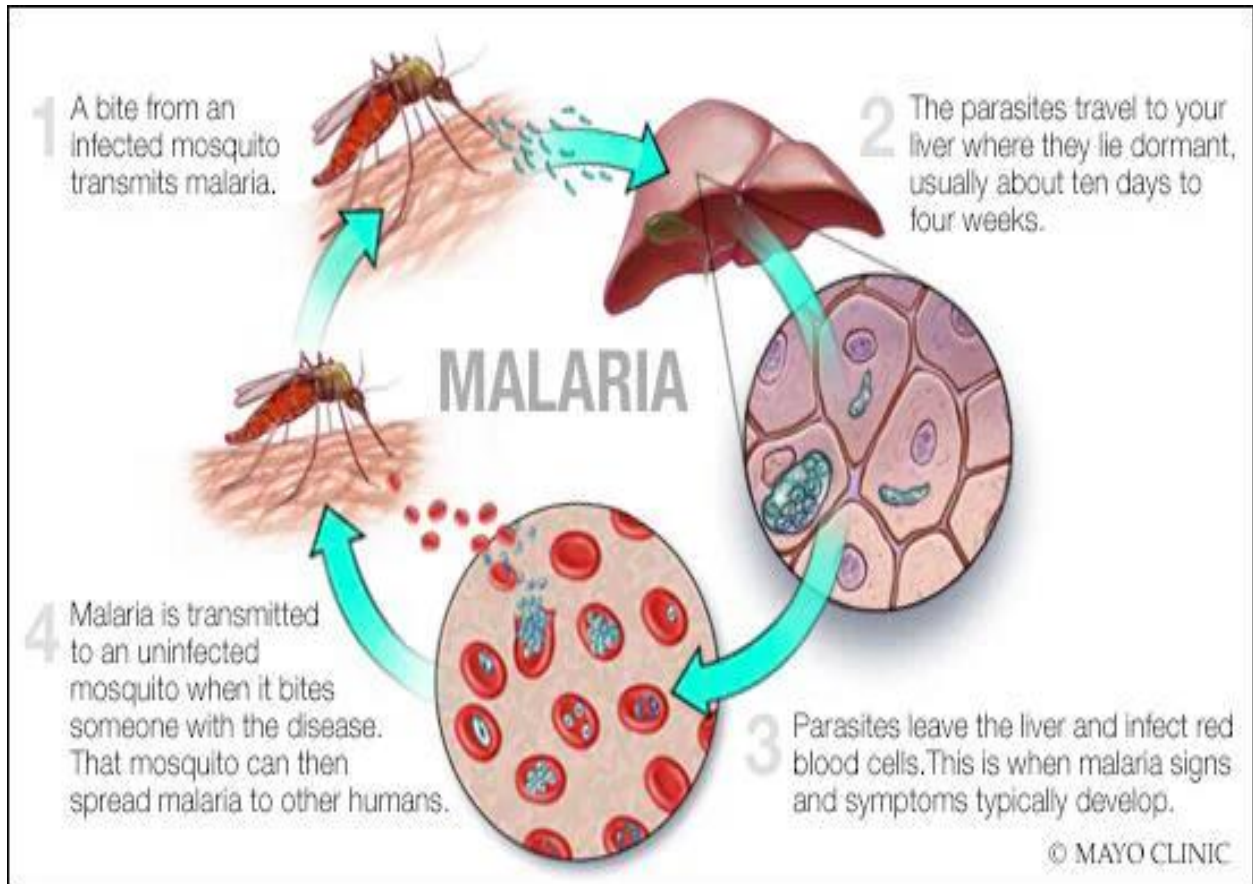
2-Erythrocytic schizogony cycle: asexual replication of parasite inside the RBCs

later mature stage developed to schizont which contain merozoite, which either develop to trophozoite or to gametocyte.

Sexual life cycle occur inside the mosquitoes called sporogony life cycle (producing of sporozoites).

Sexual life cycle:

Sexual life cycle inside the vector, male gametocyte (microgametocyte) fertilize the female gametocyte (macrogametocyte) to form zygote, which developed to oocyst containing numerous of sporozoites.



Physical symptoms:

1- Fever: Fever can be very high from the first day. Temperatures of 40°C and higher are often observed. Fever is usually continuous or irregular. Classic periodicity may be established after some days.

2- Hepatomegaly: The liver may be slightly tender.

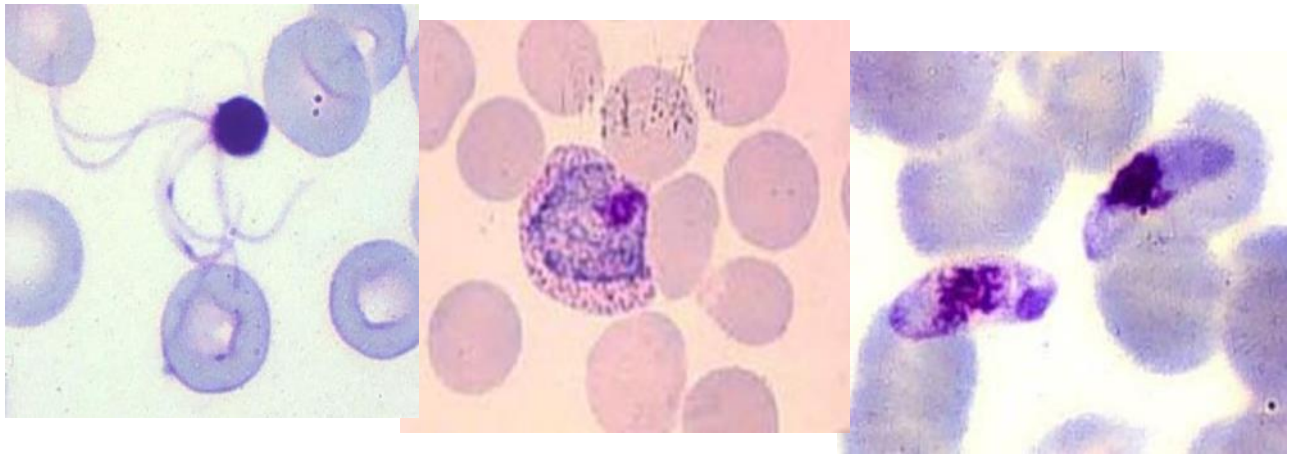
3- Splenomegaly: Splenomegaly takes many days, especially in the first attack in nonimmune children. In children from an endemic area, huge splenomegaly sometimes occurs.

4-Anemia: Prolonged malaria can cause anemia, and malarial anemia causes significant mortality.

5- Jaundice: With heavy parasitemia and large- scale destruction of erythrocytes, mild jaundice may occur. This jaundice subsides with the treatment of malaria.

6- Dehydration: High fever, poor oral intake, and vomiting all contribute to dehydration.

Diagnosis



1. Parasitological diagnosis:

Parasite; Species; Density

*Thin blood films (species identification)

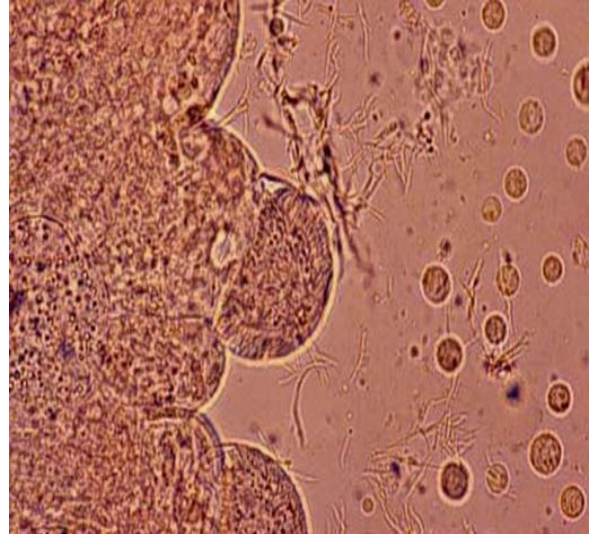
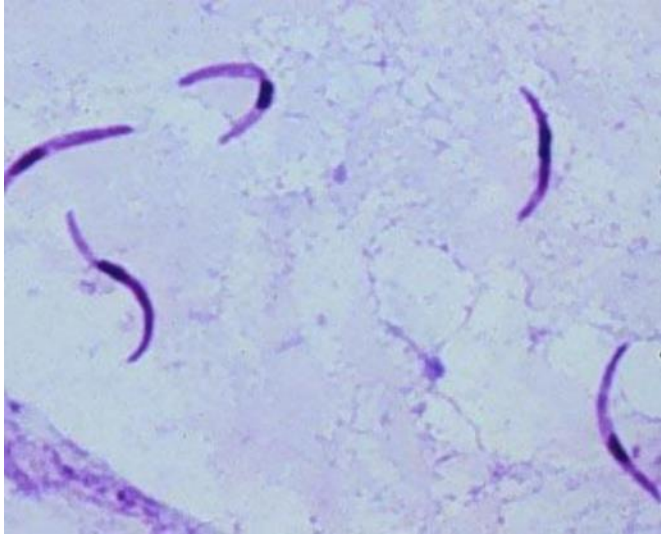
*Thick blood films

2. Immuno-diagnosis

*Specific antibody detection

*Antigen detection

* Specific DNA or RNA detection



Treatment:

*Chlorquine and quinine

*anti-erythrocytic stage drugs.

*Primaquine and pyrimethamine

*anti-exoerythrocytic stage drugs.